

WHAT IS CLAIMED AS NEW AND DESIRED TO BE SECURED BY LETTERS

PATENT OF THE UNITED STATES IS:

1. A toner composition comprising toner particles, said particles comprising a binder resin and a release agent, wherein
5 when the toner composition is pressed upon application of a pressure of 478 kg/cm² to form a toner plate, the toner plate has a surface having a coefficient of static friction of from 0.20 to 0.40.

10 2. The toner composition according to Claim 1, wherein the toner particles have a volume average particle diameter of from 4.0 to 7.5 μm and includes particles having a particle diameter not greater than 5 μm in an amount of from 60 to 80 % by number.

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3. The toner composition according to Claim 1, wherein the release agent comprises a material selected from the group consisting of carnauba waxes, montan waxes and oxidized rice waxes.

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4. The toner composition according to Claim 1, wherein the release agent is present in the toner particles in an amount of from 2 to 10 % by weight based on the binder resin in the toner particles.

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5. The toner composition according to Claim 1, wherein the binder resin comprises a non-linear polymer A, a linear

polymer B and a polymer C, wherein the polymer C is prepared by at least one of performing a condensation polymerization reaction and an addition polymerization reaction at a same time in a container using a mixture of monomers for the condensation 5 polymerization reaction and the addition polymerization reaction; and performing a condensation polymerization reaction and an addition polymerization reaction independently in a container using a mixture of monomers for the condensation polymerization reaction and the addition polymerization reaction and the addition polymerization 10 reaction, and wherein the non-linear polymer A, the linear polymer B and the polymer C comprise a polymer unit of the same kind.

6. The toner composition according to Claim 5, wherein 15 the polymer unit is a unit selected from the group consisting of polyester units and polyamide units.

7. The toner composition according to Claim 5, wherein the following relationships are satisfied:

$$20 \quad T_m(A) > T(C) > T_m(B)$$

$$|T_g(A) - T_g(B)| < 10 \text{ } (^{\circ}\text{C})$$

$$30 \leq T_m(A) - T_m(B) \leq 60 \text{ } (^{\circ}\text{C})$$

wherein $T_m(A)$, $T_m(B)$ and $T_m(C)$ represent softening points of the non-linear polymer A, the linear polymer B and the polymer 25 C, respectively; and $T_g(A)$ and $T_g(B)$ represent glass transition temperatures of the non-linear polymer A and the linear polymer B, respectively.

8. The toner composition according to Claim 5, wherein
the non-linear polymer A has an acid value of from 20 to 70
mgKOH/g.

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9. The toner composition according to Claim 5, wherein
the linear polymer B has an acid value of from 7 to 70 mgKOH/g.

10. The toner composition according to Claim 1, wherein
10 the toner particles further comprises a salicylic acid metal
compound having at least 3 valence.

11. The toner composition according to Claim 10, wherein
the salicylic acid metal compound is included in the toner
15 particles in an amount of from 0.05 to 10 parts by weight per
100 parts by weight of the binder resin.

12. The toner composition according to Claim 5, wherein
the non-linear polymer A has a hydroxyl value not less than 20
20 mgKOH/g.

13. The toner composition according to Claim 1, further
comprising an external additive, wherein the toner particles
are covered by the external additive at a coverage not less than
25 20 %.

14. The toner composition according composition to Claim

13, wherein the external additive comprises two different inorganic fillers A and B.

15. The toner composition according to Claim 14, wherein
5 the two different inorganic fillers A and B are a silica and
a titanium oxide.

16. The toner composition according to Claim 14, wherein
the two different inorganic fillers A and B have different
10 average primary particle diameters.

17. The toner composition according to Claim 16, wherein
the inorganic filler A has an average primary particle diameter
smaller than that of the inorganic filler B and is included in
15 the toner composition in an amount greater than that of the
inorganic filler B.

18. The toner composition according to Claim 16, wherein
the inorganic fillers A and B have an average primary particle
20 diameter not greater than 0.03 μm and not greater than 0.2 μm ,
respectively.

19. The toner composition according to Claim 14, wherein
at least one of the inorganic fillers A and B is treated with
25 an organic silane compound.

20. A method for manufacturing a toner composition

comprising:

providing a polymer C by at least one of performing a condensation polymerization reaction and an addition polymerization reaction at a same time in a container using a mixture of monomers for the condensation polymerization reaction and addition polymerization reaction; and performing a condensation polymerization reaction and an addition polymerization reaction independently in a container using a mixture of monomers for the condensation polymerization reaction and addition polymerization reaction;

10 kneading a mixture comprising the polymer C, a non-linear polymer A, a linear polymer B and a release agent upon application of heat;

cooling the mixture to solidify the mixture;

15 pulverizing the mixture;

classifying the mixture to prepare toner particles, wherein the non-linear polymer A, the linear polymer B and the polymer C comprise a polymer unit of the same kind..

20 21. The method according to Claim 20, wherein the release agent has a volume average particle diameter of from 10 to 800 μm before mixed with the polymers A, B and C.

25 22. A two component developer comprising a toner composition and a carrier, wherein the toner composition comprises toner particles, said particles comprising a binder resin and a release agent, and wherein when the toner composition

is pressed upon application of a pressure of 478 kg/cm² to form a toner plate, the toner plate has surface having a coefficient of static friction of from 0.20 to 0.40.

5 23. The two component developer according to Claim 22, wherein the toner particles further comprise a magnetic material, and wherein the carrier is a magnetic carrier.

10 24. A toner container containing a toner composition, said toner composition comprising toner particles, and said particles comprising a binder resin and a release agent, wherein the toner composition is pressed upon application of a pressure of 478 kg/cm², the toner plate has a surface having a coefficient of static friction of from 0.20 to 0.40.

15 25. A developer container containing a two component developer comprising a toner composition and a carrier, wherein the toner composition comprises toner particles, said particles comprising a binder resin and a release agent, and wherein the toner composition is pressed upon application of a pressure of 478 kg/cm², the toner plate has a surface having a coefficient of static friction of from 0.20 to 0.40.

20 26. An image forming apparatus comprising:
25 an image bearing member configured to bear an electrostatic latent image;
 an image developer configured to develop the

electrostatic latent image with a developer comprising a carrier and a toner composition to form a toner image on the image bearing member;

an image transferer configured to transfer the toner image

5 on a receiving material optionally via an intermediate transfer medium; and

a fixer configured to fix the toner image on the receiving material upon application of heat and pressure,

wherein the image forming apparatus has a waiting period

10 not longer than 15 seconds, a maximum electric power consumption not greater than 1.5 KW when image forming operations are performed and a maximum power consumption not greater than 30 W when image forming operations are not performed, and

15 wherein the toner composition comprises toner particles, said particles comprising a binder resin and a release agent, and wherein when the toner composition is pressed upon application of a pressure of 478 kg/cm² to form a toner plate, the toner plate has a surface having a coefficient of static friction of from 0.20 to 0.40.

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27. The image forming apparatus according to Claim 26, wherein the waiting period is not longer than 10 seconds.

25 28. The image forming apparatus according to Claim 26, further having an image forming speed not less than 30 cpm/A-4 size.

29. The image forming apparatus according to Claim 26,
wherein the fixer comprises:

a fixing roller A having a heater therein and configured
to heat the toner image on the receiving material while
5 contacting the toner image; and

a fixing roller B optionally having a heater therein and
configured to nip the receiving material to the fixing member
A,

wherein the fixing roller A has a thickness of 0.7 mm,
10 and a pressure not greater than 1.5×10^5 Pa is applied to the
fixing members A and B.

30. The image forming apparatus according to Claim 26,
wherein the fixer comprises:

15 a fixing member configured to heat the toner image on the
receiving material while contacting the toner image;
a fixed heater configured to heat the fixing member; and
a pressure member configured to press the receiving
material to the fixing member,

20 wherein the fixing member is at least one of a belt and
an endless belt.

31. The image forming apparatus according to Claim 26,
further comprising the toner container according to Claim 24.

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32. The image forming apparatus according to Claim 26,
further comprising the developer container according to Claim

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33. An image forming method comprising:

forming a toner image on a receiving material; and

5 passing the receiving material through a nip between two fixing members A and B while applying a pressure to the fixing members A and B to fix the toner image on the receiving material upon application of heat and pressure, wherein the receiving material contacts the fixing member A,

10 and wherein the toner comprises toner particles, said particles comprising a binder resin and a release agent, and when the toner is pressed upon application of a pressure of 478 kg/cm² to form a toner plate, the toner plate has a surface having a coefficient of static friction of from 0.20 to 0.40.

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34. The image forming method according to Claim 33, wherein the fixing member A has a thickness of 0.7 mm, and wherein the pressure is not greater than 1.5×10^5 Pa.

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35. The image forming method according to Claim 33, wherein the fixing member A is at least one of a belt or an endless belt and is heated by a fixed heater.

36. A developing device comprising:

25 a developer bearing member having a magnetic field generating means therein and configured to bear a developer comprising a magnetic carrier and a magnetic toner composition

while rotating;

a first regulation member configured to regulate the amount of the developer supplied to the developer bearing member to form a developer layer on the developer bearing member;

5 a developer containing member configured to contain the developer scraped by the first regulating member; and

a toner containing member located adjacent to the developer containing member and configured to supply the magnetic toner composition to the developer bearing member

10 through an opening,

wherein the developer containing member comprises:

a second regulating member located on an upstream side from the first regulating member relative to the rotating direction of the developer bearing member, and configured to scrape the developer layer when a concentration of the magnetic toner in the developer layer increases and the developer layer thickens, to cover the opening with the scraped developer to stop the supply of the magnetic toner composition from the toner containing member, and

20 wherein the magnetic toner composition comprises toner particles, said particles comprising a magnetic material, a binder resin and a release agent, and when the magnetic toner composition is pressed upon application of a pressure of 478 kg/cm² to form a toner plate, the toner plate has a surface having 25 a coefficient of static friction of from 0.20 to 0.40.